

a1
--Optical carrier generator 110 generates an optical carrier signal having two side frequencies as described below. Splitter S1 further splits radiation signal 104 into signals 107 and 109, transmitted to phase modulators PM1 and PM2 of the optical carrier generator 110 respectively. Each of modulators PM1 and PM2 receives a radio frequency (RF) electrical signal from respective RF signal generators SG1 and SG2, which are equal in amplitude and opposite in phase. In an embodiment, RF signal generators SG1 and SG2 of optical carrier generator 110 transmit 15 or 30 GHz signals of equal amplitude to the respective modulators. Using the input RF signals, each phase modulator PM1, PM2 outputs a carrier, with one carrier spaced above or below f_{SR1-A} and another carrier spaced below f_{SR1-A} by the amount of the modulation frequency and multiples of the modulation frequency.--

Please replace the paragraph on pages 6-7, line 35, with the following rewritten paragraph:

b2
--At splitter S2, the output carrier signal 112 is split into two branches 114, 116. Each branch is further split in sub-branches at splitters S3 and S4. The sub-branches output from splitter S3 are input to an upper data modulator 140 and the sub-branches output from splitter S4 are input to a lower data modulator 145. Each data modulator 140, 145 modulates or imprints data onto the optical carrier signal. A first sub-branch signal from S3 is input to Mach-Zehnder interferometer MZ1 of data modulator 140, which also receives an input data signal from a modulator driver MD1 that in turn receives a 10 Gbp/s data signal from digital signal generator DS1. The modulator driver MD1 may be implemented as an oscillator, for example. The interferometer MZ1 acts as an amplitude modulator and imprints the input data signal onto the spectrum of the optical carrier signal. The second sub-branch signal from S3 is input to an optical shifter OS2 which shifts the carrier signal 90 degrees in phase. The output from OS2 is transmitted to an interferometer MZ2, where a similar data modulation takes place (using a 10Gbp/s data signal from data signal generator DS2). Due to the phase shifting of the second sub-branch by OS2, the two data modulations at MZ1 and MZ2 are performed on carrier signals that are 90 degrees out of phase with respect to each other, and therefore in quadrature. When the output from MZ1 and MZ2 are combined in CMB2, the two data-modulated carriers do not interfere because of their orthogonal phase relationship. Therefore, two data signals from DS1 and DS2 are able to occupy the same spectral region, doubling data capacity to 20 Gbp/s. This spectrum of the output from CMB2 is shown in FIG. 2b. The shaded regions represent areas of the spectrum carrying data,

az denoted as data bands. The regions extend an octave of 20 GHz, centered on $f_{\text{SRI-A}} \pm 30$ GHz with respect to $f_{\text{SRI-A}}$.

Please replace the paragraph on pages 8-9, beginning with line 19, with the following rewritten paragraph:

az --CMB5, which receives the output of data modulator 145 in block A transmits an output signal to combiner CMB14. The output of CMB9 of block B is input to a polarization transformer PT1, before being combined with the output of CMB5 at CMB14. The functionality of the combiner CMB14 and the polarization transformer PT1 can also be implemented in a single polarization combiner component. The polarization transformer PT1 rotates the polarization of the input signal 90 degrees, from x-polarization to y-polarization, thereby encoding the input with a y-polarization. The output of combiner CMB4 at the upper branch of block A is passed on to a combiner CMB11 which also receives input from another transmitter block which is not shown. Blocks A and B may be replicated in a series of adjacent transmission channels above and below transmitter 100 in a dense wavelength division multiplexing scheme. In this scheme, combiner CMB11 would receive an output from a polarization transformer in a transmitter block above Block A corresponding to the output from polarization transformer PT2 shown in the lower portion of block B described as follows. The output of combiner CMB10 in block B is passed to the polarization transformer PT2, where the polarization of the output signal is transformed to y-polarization and then transmitted to combiner CMB12, which receives input from a combiner corresponding to combiner CMB4 of Block A output from a further transmitter block below Block B, not shown.--

Remarks

Attached hereto is a marked-up version of the changes made to the specification by the current amendment. The attached page is captioned "Version With Markings To Show Changes Made."